Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended): A method to obtain information from ~~an interaction of a~~ interaction of at least one user-object with a virtual input ~~transfer~~ device definable on a virtual input device plane, the method comprising the following steps:

(a) generating a fan beam light ~~defining a~~ plane substantially parallel to and spaced a small distance above said virtual input device plane such that penetration of said fan beam light plane by a user-object is equivalent to interactingly touching a virtual input device position on said virtual input device plane ~~spaced above a presumed location of said virtual transfer device~~;

(b) using a sensor system operable with a single sensor that acquires data representing a single image at a given time to determine from light reflected from said fan beam light plane if and when at least a portion of said user-object penetrates said fan beam light plane and thus interactingly touches a position on said virtual input device plane ~~sensing when a user-object penetrates said plane to interact with said virtual transfer device~~; and

(c) determining for each touching of said virtual input device plane determined to occur at step (b) contact position relative to said single sensor; ~~determining relative position of a portion of said user-object on said plane.~~

wherein a function of said virtual input device associated with each contact position determined at step (c) is ascertainable.

Claims 2-27 (cancelled).

28. (new): The method of claim 1, further including:

(d) transferring to a companion device information commensurate with contact position determined at step (c) relative to said virtual input device;

wherein interaction of said user-object with said virtual input device affects operation of said companion device.

29. (new): The method of claim 1, wherein step (a) includes generating said light plane using optical energy, and wherein step (b) includes detecting a reflected portion of said optical energy when at least a portion of said user-object penetrates said light plane.

30. (new): The method of claim 1, wherein at least one of step (b) and step (c) is carried out using triangulation analysis.

31. (new): The method of claim 28, wherein said companion device includes at least one of (I) a PDA , (ii) a portable communication device, (iii) an electronic device, (iv) an electronic game device, and (v) a musical instrument, and said virtual input device is at least one of (I) a projected image of a virtual keyboard, (II) a printed image of a virtual keyboard, (III) a virtual mouse, (IV) a virtual trackball, (V) a virtual pen, (VI) a virtual trackpad, and (VII) a user-interface selector.

32. (new): The method of claim 1, wherein said virtual input device is mapped to a work surface selected from at least one of (I) a table top, (ii) a desk top, (iii) a wall, (iv) a point-of-sale appliance, (v) a point-of-service appliance, (vi) a kiosk, (vii) a surface in a vehicle, (viii) a projected display, (ix) a physical display, (x) a CRT, and (xi) an LCD.

33. (new): The method of claim 1, wherein step (b) includes providing a camera with a lens having a lens optical axis, and providing an image plane, and further including improving at least one of resolution and depth of field of said camera by tilting said image plane relative to said lens optical axis.

34. (new): The method of claim 1, wherein:

step (a) includes generating said light plane using an optical source; and

step (b) includes providing a camera to sense penetration of said light plane.

35. (new): The method of claim 34, further including:

synchronizing operation of said optical source and said camera such that effects of ambient light upon accuracy of information obtained at at least one of step (b) and step (c) are reduced.

36. (new): The method of claim 34, wherein step (a) includes generating said light plane with a source that emits optical energy bearing a signature;

wherein effects of ambient light are reduced.

37. (new) The method of claim 1, wherein:

step (b) includes acquiring ambient light information generated by ambient light by determining when said user-object is distant from said light plane; and

at least one of step (b) and step (c) includes subtracting said ambient light information from information acquired when said user-object interacts with said virtual input device;

wherein effects of ambient light are reduced.

38. (new): The method of claim 1, wherein said user-object includes at least a portion of a user's hand.

39. (new): The method of claim 1, wherein said virtual input device includes a virtual keyboard.

40. (new): The method of claim 1, wherein said virtual input device includes a virtual mouse, and wherein functionality includes tracking virtual motion of said virtual mouse.

41. (new): The method of claim 1, wherein said virtual input device includes a virtual trackball, and wherein functionality includes tracking virtual motion of said virtual trackball.

42. (new): The method of claim 1, wherein said virtual input device includes a virtual pen.

43. (new): The method of claim 28, wherein:

said user-object includes at least a portion of a user's hand;

said virtual input device includes a virtual keyboard; and

said companion device includes at least one of (I) a PDA, (ii) a mobile telephone, and (iii) a computer.

44. (new): The method of claim 28, wherein:

said user-object includes at least a portion of a user's hand;

said virtual input device includes a virtual mouse, and

said companion device includes at least one of (I) a PDA, (ii) a mobile telephone, and (iii) a computer.

45. (new): The method of claim 28, wherein:

said user-object includes at least a portion of a user's hand;

said virtual input device includes a virtual trackball, and

said companion device includes at least one of (I) a PDA, (ii) a mobile telephone, and (iii) a computer.

46. (new): The method of claim 28, wherein:

said user-object includes at least a portion of a user's hand;

said virtual input device includes a virtual pen, and

said companion device includes at least one of (I) a PDA, (ii) a mobile telephone, and (iii) a computer.

47. (new): A system to obtain information from interaction of at least one user-object with a virtual input device definable on a virtual input device plane, the system including:

means for generating a fan beam light plane substantially parallel to and spaced a small distance above said virtual input device plane such that penetration of said fan beam light plane by a user-object is equivalent to interactingly touching a virtual input device position on said virtual input device plane;

a sensor system operable with a single sensor to acquire data representing a single image at a given time to determine from light reflected from said fan beam light plane if and when at least a portion of said user-object penetrates said fan beam light plane and thus interactingly touches a position on said virtual input device plane; and

means for determining, for each touching of said virtual input device plane determined by said sensor system, contact position relative to said single sensor;

wherein a function of said virtual input device associated with each contact position determined by said means for determining is ascertainable.

48. (new): The system of claim 47, further including:

means for transferring to a companion device information commensurate with contact position determined by said means for determining relative to said virtual input device;

wherein interaction of said user-object with said virtual input device affects operation of said companion device.

49. (new): The system of claim 47, wherein:

said means for generating said light plane includes a generator of optical energy; and

said sensor system detects a reflected portion of said optical energy when at least a portion of said user-object penetrates said light plane.

50. (new): The system of claim 47, wherein:

said means for generating said light plane includes a fan beam optical energy generator.

51. (new): The system of claim 47, wherein at least one said sensor system and said means for determining operates using triangulation analysis.

52. (new): The system of claim 48, wherein said companion device includes at least one of (I) a PDA , (ii) a portable communication device, (iii) an electronic device, (iv) an electronic game device, and (v) a musical instrument, and said virtual input device is at least one of (I) a projected image of a virtual keyboard, (II) a printed image of a virtual keyboard, (III) a virtual mouse, (IV) a virtual trackball, (V) a virtual pen, (VI) a virtual trackpad, and (VII) a user-interface selector.

53. (new): The system of claim 47, wherein said virtual input device is mapped to a work surface selected from at least one of (I) a table top, (ii) a desk top, (iii) a wall, (iv) a point-of-sale appliance, (v) a point-of-service appliance, (vi) a kiosk, (vii) a surface in a vehicle, (viii) a projected display, (ix) a physical display, (x) a CRT, and (xi) an LCD.

54. (new): The system of claim 47, wherein said sensor system includes a camera with a lens having a lens optical axis and an image plane; wherein at least one of resolution and depth of field of said camera is improved by tilting said image plane relative to said lens optical axis.

55. (new): The system of claim 47, wherein:

said means for generating said light plane includes an optical source; and

said sensor system includes a camera to sense penetration of said light plane.

56. (new): The system of claim 55, further including:

means for synchronizing operation of said optical source and said camera such that effects of ambient light upon accuracy of information obtained by at least one of said sensor system and said means for determining are reduced.

57. (new): The system of claim 55, wherein said means for generating generates said light plane with an optical source that emits optical energy bearing a signature;

wherein effects of ambient light are reduced.

58. (new): The system of claim 47, wherein:

said sensor system acquires ambient light information generated by ambient light by determining when said user-object is distant from said light plane; and

at least one of said sensor system and said means for determining subtracts said ambient light information from information acquired when said user-object interacts with said virtual input device;

wherein effects of ambient light are reduced.

59. (new): The system of claim 47, wherein said user-object includes at least a portion of a user's hand.

60. (new): The system of claim 47, wherein said virtual input device includes a virtual keyboard.

61. (new): The system of claim 47, wherein said virtual input device includes a virtual mouse, and wherein functionality includes tracking virtual motion of said virtual mouse.

62. (new): The system of claim 47, wherein said virtual input device includes a virtual trackball, and wherein functionality includes tracking virtual motion of said virtual trackball.

63. (new): The system of claim 47, wherein said virtual input device includes a virtual pen.

64. (new): The system of claim 48, wherein:

said user-object includes at least a portion of a user's hand;

said virtual input device includes a virtual keyboard; and

said companion device includes at least one of (I) a PDA, (ii) a mobile telephone, and (iii) a computer.

65. (new): The system of claim 48, wherein:

said user-object includes at least a portion of a user's hand;

said virtual input device includes a virtual mouse, and

said companion device includes at least one of (I) a PDA, (ii) a mobile telephone, and (iii) a computer.

66. (new): The system of claim 48, wherein:

said user-object includes at least a portion of a user's hand;

said virtual input device includes a virtual trackball, and

said companion device includes at least one of (I) a PDA, (ii) a mobile telephone, and (iii) a computer.

67. (new): The system of claim 48, wherein:

said user-object includes at least a portion of a user's hand;

said virtual input device includes a virtual pen, and

said companion device includes at least one of (I) a PDA, (ii) a mobile telephone, and (iii) a computer.

68. (new): The system of claim 47, wherein:

said sensor system acquires data a frame at a time;

said user-object includes a user's hand with multiple fingers; and

said means for determining includes an algorithm that associates sensor system acquired images of said user's fingers in a first said frame with sensor system acquired images of said user's fingers in a second said frame and determines said contact position based upon trajectory of motion of said fingers in said images.

69. (new): A PDA device including a system to obtain information from interaction of at least one user-object with a virtual input device definable on a virtual input device plane, the system including:

means for generating a fan beam light plane substantially parallel to and spaced a small distance above said virtual input device plane such that penetration of said fan beam light plane by a user-object is equivalent to interactingly touching a virtual input device position on said virtual input device plane;

a sensor system operable with a single sensor to acquire data representing a single image at a given time to determine from light reflected from said fan beam light plane if and when at least a portion of said user-object penetrates said fan beam light plane and thus interactingly touches a position on said virtual input device plane; and

means for determining, for each touching of said virtual input device plane determined by said sensor system, contact position relative to said single sensor;

wherein a function of said virtual input device associated with each contact position determined by said means for determining is ascertainable and is coupled to said PDA to affect operation of said PDA.

70. (new): The PDA of claim 70, wherein:

said means for generating said light plane includes a fan beam optical energy generator; and

said virtual input device is at least one of (I) a projected image of a virtual keyboard, (II) a printed image of a virtual keyboard, (III) a virtual mouse, (IV) a virtual trackball, (V) a virtual pen, (VI) a virtual trackpad, and (VII) a user-interface selector.

71. (new): A cell telephone device including a system to obtain information from interaction of at least one user-object with a virtual input device definable on a virtual input device plane, the system including:

means for generating a fan beam light plane substantially parallel to and spaced a small distance above said virtual input device plane such that penetration of said fan beam

light plane by a user-object is equivalent to interactingly touching a virtual input device position on said virtual input device plane;

a sensor system operable with a single sensor to acquire data representing a single image at a given time to determine from light reflected from said fan beam light plane if and when at least a portion of said user-object penetrates said fan beam light plane and thus interactingly touches a position on said virtual input device plane; and

means for determining, for each touching of said virtual input device plane determined by said sensor system, contact position relative to said single sensor;

wherein a function of said virtual input device associated with each contact position determined by said means for determining is ascertainable and is coupled to said cell telephone device to affect operation of said cell telephone device.

72. (new): The cell telephone device of claim 72, wherein:

said means for generating said light plane includes a fan beam optical energy generator; and

said virtual input device is at least one of (I) a projected image of a virtual keyboard, (II) a printed image of a virtual keyboard, (III) a virtual mouse, (IV) a virtual trackball, (V) a virtual pen, (VI) a virtual trackpad, and (VII) a user-interface selector.

Dated: 30 December 2003

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